^{238}U(^{48}Ca,Xγ) 2010Br14

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	28-Feb-2011

Deep-inelastic heavy-ion reactions. Three different experiments.
1. E(^{48}Ca)=330 MeV provided by the ATLAS accelerator at ANL. Measured Eγ, Iγ, $\gamma\gamma$ using the Gammasphere array.
2. E(^{48}Ca)=330 MeV from Legnaro Tandem-ALPI Linac accelerator using PRISMA-CLARA spectrometer. Measured Eγ, Iγ, $\gamma\gamma$.
3. ^{48}Ca(^{208}Pb,Xγ) at 300 MeV, Legnaro accelerator facility. PRISMA-CLARA array. Plunger method used to measure lifetimes.
Comparison with shell-model calculations.

^{49}K Levels

E(level)	J$^\pi$ †	$T_{1/2}$	Comments
0	(1/2$^+$)		Configuration=$\pi s^{-1}_{1/2}$ state.
91.7 *3*	(3/2$^+$)	8 ns *5*	Configuration=$\pi d^{-1}_{3/2}$ state. $T_{1/2}$: >3 ns from recoil-distance method, <13 ns from $\gamma\gamma$ time distribution of 771-92 $\gamma\gamma$ events (2010Br14).
862.8 *3*	(5/2$^+$)	2.2 ps *4*	$T_{1/2}$: from recoil-distance method (2010Br14). Effective half-life, includes feeding from higher-lying stated.
1102.9? *8*	(5/2$^+$)		Placement of 1011γ is either to 92-keV level as shown in figure 3 of 2010Br14 or to the g.s.
1438.3 *4*	(7/2$^+$)	>0.35 ps	$T_{1/2}$: from thick-target data where 575γ appears as a narrow line (2010Br14). The fit to the ratio $I_{after}/[I_{before}+I_{after}]$ gave $T_{1/2}$=3.4 ps *7* for 575.5γ which could imply $T_{1/2}$ is much shorter than 2.2 ps for the 863-keV state which is populated by 575γ.
2104.2 *5*	(7/2$^-$)	>0.35 ps	Configuration=$\pi f_{7/2}$ state. $T_{1/2}$: from thick-target data where 1241γ appears as a narrow line (2010Br14).

† From shell-model predictions (2010Br14). But see also calculations in 2009No01, where 3/2$^+$ is g.s. and 1/2$^+$ at about 75 keV.

γ(^{49}K)

E$_\gamma$	I$_\gamma$ †	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Comments
91.7 *3*	51 *9*	91.7	(3/2$^+$)	0	(1/2$^+$)	I$_\gamma$: 32 *9* in experiment #1.
575.5 *2*	44 *8*	1438.3	(7/2$^+$)	862.8	(5/2$^+$)	I$_\gamma$: 36 *5* in experiment #1.
771.1 *2*	100	862.8	(5/2$^+$)	91.7	(3/2$^+$)	
862.6 *8*	7 *7*	862.8	(5/2$^+$)	0	(1/2$^+$)	I$_\gamma$: 8 *4* in experiment #1.
1011.2 *8*	38 *9*	1102.9?	(5/2$^+$)	91.7	(3/2$^+$)	Placement of 1011γ is either to 92-keV level as shown in figure 3 of 2010Br14 or to the g.s. I$_\gamma$: 36 *8* in experiment #1.
1241.4 *4*	33 *9*	2104.2	(7/2$^-$)	862.8	(5/2$^+$)	I$_\gamma$: 35 *6* in experiment #1.

† From experiment #2. Values from experiment #1 are in comments.

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Level Scheme

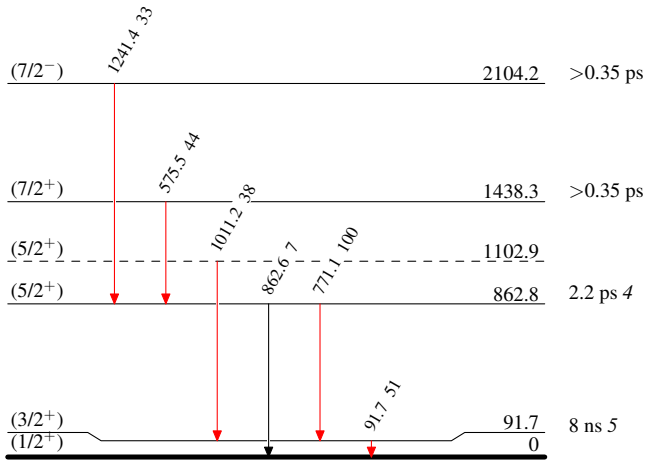
Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



$^{49}_{19}K_{30}$